```
=> d his

     (FILE 'HOME' ENTERED AT 16:38:36 ON 06 AUG 2003)

     FILE 'WPIDS' ENTERED AT 16:38:45 ON 06 AUG 2003
L1        301317 S CARBON
L2          1021 S LYMPHATICS OR (LYMPH NODE)
L3            16 S L1 AND L2

     FILE 'USPATFULL' ENTERED AT 16:41:25 ON 06 AUG 2003
L4          9118 S CARBON PARTICLES
L5            19 S CH40
L6        107184 S INK
L7         61280 S CARBON BLACK
L8        163552 S L4 OR L5 OR L6 OR L7
L9         11914 S LYMPH NODE
L10         1208 S LYMPHATICS
L11        12441 S L9 OR L10
L12          403 S L8 AND L11
L13       117259 S SENTINEL OR EXCIS? OR MAPPING OR MELANOMA OR (BREAST CANCER)
L14          318 S L12 AND L13

=> log hold
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                    34.30      51.65

 SESSION WILL BE HELD FOR 60 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 16:51:56 ON 06 AUG 2003
```

```
     FILE 'MEDLINE' ENTERED AT 14:36:51 ON 06 AUG 2003
L25       106483 S LYMPH NODE
L26       192736 S CARBON
L27          688 S L25 AND L26
L28        97127 S PARTICLE OR INK
L29          145 S L28 AND L27
L30      1536072 S PATHOLOGY OR EXCISION OR BIOPSY OR MAPPING OR SENTINEL
L31           77 S L30 AND L29

=> log hold
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                      ENTRY    SESSION
FULL ESTIMATED COST                                   15.92      76.47

 SESSION WILL BE HELD FOR 60 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 14:52:10 ON 06 AUG 2003
```

L3 ANSWER 11 OF 16 WPIDS COPYRIGHT 2003 THOMSON DERWENT on STN
AN 2000-490766 [43] WPIDS
CR 2001-202634 [20]
DNN N2000-364272 DNC C2000-147340
TI Subcutaneous cavity marking device for detecting if cancerous cells have spread to sentinel **lymph node**, has detectable marker(s) attached to filler(s).
DC A96 B07 D22 P31 S05
IN BUSH, M E; CONSTON, S R; FAWZI, N V; LEBOVIC, G S; MORRISSEY, A B; SIRIMANNE, D L; SUTTON, D S; WILSON, P M; LEBOVIC, G
PA (VIVA-N) VIVANT MEDICAL INC; (FAWZ-I) FAWZI N V; (LEBO-I) LEBOVIC G; (SIRI-I) SIRIMANNE D L; (SUTT-I) SUTTON D S
CYC 90
PI WO 2000038579 A2 20000706 (200043)* EN 112p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000025924 A 20000731 (200050)
EP 1152696 A2 20011114 (200175) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
US 6356782 B1 20020312 (200221)
US 2002035324 A1 20020321 (200224)
US 6371904 B1 20020416 (200232)
US 2002107437 A1 20020808 (200254)
ADT WO 2000038579 A2 WO 1999-US30619 19991223; AU 2000025924 A AU 2000-25924 19991223; EP 1152696 A2 EP 1999-968528 19991223, WO 1999-US30619 19991223; US 6356782 B1 CIP of US 1998-220618 19981224, US 1999-285329 19990402; US 2002035324 A1 CIP of US 1998-220618 19981224, Cont of US 1999-285329 19990402, US 2001-805652 20010313; US 6371904 B1 CIP of US 1998-220618 19981224, CIP of US 1999-285329 19990402, US 1999-347185 19990702; US 2002107437 A1 CIP of US 1998-220618 19981224, Cont of US 1999-285329 19990402, Cont of US 2001-805652 20010313, US 2002-114712 20020401
FDT AU 2000025924 A Based on WO 200038579; EP 1152696 A2 Based on WO 200038579; US 2002107437 A1 Cont of US 6356782
PRAI US 1999-347185 19990702; US 1998-220618 19981224; US 1999-285329 19990402; US 2001-805652 20010313; US 2002-114712 20020401
AB WO 200038579 A UPAB: 20020823
NOVELTY - A subcutaneous cavity marking device has detectable marker(s) attached to filler(s).

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(a) the above device where the body includes resilient biocompatible material;

(b) the above device where the body includes non bioabsorbable suture material and the marker is radiopaque;

(c) the above device where the marker is not bioabsorbable and the body is bioabsorbable;

(d) a composition having non-toxic non-radioactive microparticles for migrating from an insertion site to a **lymph node** in under 3 hours. The particles are detectable non-invasively;

(e) a cavity marking delivery device having a delivery device in a lumen of a cartridge. The cartridge slides on a disengaging arm;

(f) a delivery device having an ejector coupled to an elongate member. The ejector disengages a marking device seated on the member;

(g) delivery systems including (f);

(h) kits including (a), (b), (c), (d) or (f);

(i) marking a tissue cavity using devices as in (a) and (f);

(j) marking a tissue cavity using a delivery device to access the cavity and then deploy a remotely detectable device;

(k) delivering a marking device into a cavity using a medical instrument probe to install an outer sheath, delivering the device through the sheath and then withdrawing the sheath;

(l) delivering a marking device into a cavity using a medical instrument cannula having a side window. The device is ejected through the window by advancing a shaft that remains within the cannula;

(m) marking a cavity by inserting a marking device through a small opening; the device expands to mark the borders of the larger cavity;

(n) locating a sentinel **lymph node** by injecting a composition similar to (d);

(o) making a cavity marking device by rolling or folding a sheet of bioabsorbable material around a marker;

(p) making a cavity marking device by cutting a filler body material to shape, making a hole partway through the material and inserting marker(s) into the hole;

(q) locating a sentinel **lymph node** comprising:

(1) injecting a non-invasively detectable, non-radioactive, migratory contrast agent into the region of a cavity or lesion;

(2) allowing the contrast agent to migrate to a sentinel **lymph node**; and

(3) identifying the sentinel **lymph node** by non-invasively detecting the contrast agent in the sentinel **lymph node**.

Preferred Features: The microparticles may be **carbon** or silicon dioxide.

USE - As subcutaneous cavity and sentinel node marking devices, delivery devices and methods. For detecting if cancerous cells have spread to a sentinel **lymph node**, etc. Methods and devices enable determination of the location, orientation and periphery of cavity by radiographic, mammographic, echographic or other noninvasive techniques.

ADVANTAGE - The technique is non-invasive.

DESCRIPTION OF DRAWING(S) - The figure illustrates the marking of a biopsy tissue cavity.

access device 400

marking device 402

cavity 404

breast tissue 406

distal end 408

pusher 412

Dwg.4B/13

=>

```
=> d pn 124 164 274

L14  ANSWER 124 OF 318  USPATFULL on STN
PI     US 6395712          B1   20020528
       WO 9735012  19970925

L14  ANSWER 164 OF 318  USPATFULL on STN
PI     US 6205352          B1   20010320

L14  ANSWER 274 OF 318  USPATFULL on STN
PI     US 5732704               19980331
```

L31 ANSWER 1 OF 77 MEDLINE on STN
AN 2002722324 MEDLINE
DN 22372388 PubMed ID: 12484057
TI Detection of **sentinel** lymphatic region with activated **carbon particles** in **lymph node** dissection for colorectal cancer.
AU Toma Atsushi; Hagiwara Akeo; Otsuji Eigo; Okamoto Kazuma; Kuriu Yoshiaki; Ito Tadao; Shimomura Katsumi; Takagi Tsuyoshi; Takemura Manabu; Fujiyama Junshin; Yamagishi Hisakazu
CS Dept. of Digestive Surgery, Kyoto Prefectural University of Medicine.
SO GAN TO KAGAKU RYOHO [JAPANESE JOURNAL OF CANCER AND CHEMOTHERAPY], (2002 Nov) 29 (12) 2291-3.
Journal code: 7810034. ISSN: 0385-0684.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 200301
ED Entered STN: 20021218
Last Updated on STN: 20030115
Entered Medline: 20030114
AB **Sentinel** node navigation surgery (SNNS) for gastrointestinal cancer has been examined using various methods, but the SN concept has not been established. For 18 patients who had colorectal cancer without macroscopic nodal metastases, we had attempted to detect **sentinel lymph nodes** (SNs) with activated **carbon particles** and investigate the existence of nodal metastases histologically. SNs were detected in 17 of 18 patients. Thus activated **carbon particles** are a useful tracer for SN detection. Three patients had microscopic nodal metastases, and two had nodal metastases in SNs. Although the remaining patient was a false negative case which had nodal metastases in non-SNs only, the nodal metastases were within the **sentinel** lymphatic region (SLR) which includes SNs. It is considered possible to safely perform minimally invasive lymphadenectomy for colorectal cancer without macroscopic nodal metastases, by means of SLR dissection using activated **carbon particles**.

L31 ANSWER 3 OF 77 MEDLINE on STN
AN 2002257052 MEDLINE
DN 21992081 PubMed ID: 11995502
TI **Lymph node** dissection in surgical treatment for remnant stomach cancer.
AU Kunisaki Chikara; Shimada Hiroshi; Nomura Masato; Hosaka Noriomi; Akiyama Hirotoshi; Ookubo Kenji; Moriwaki Yoshihiro; Yamaoka Hiroyuki
CS Second Department of Surgery, Yokohama City University School of Medicine, 3-49, Fukuura, Kanazawa-ku, Yokohama, 236-0004, Japan..
s0714@med.yokohama-cu.ac.jp
SO HEPATO-GASTROENTEROLOGY, (2002 Mar-Apr) 49 (44) 580-4.
Journal code: 8007849. ISSN: 0172-6390.
CY Greece
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200212
ED Entered STN: 20020509
Last Updated on STN: 20021217
Entered Medline: 20021203
AB BACKGROUND/AIMS: Lymphatic flow and the incidence of **lymph node** metastasis in remnant stomach cancer after distal gastrectomy are obscure. There is consequent controversy about appropriate **lymph node** dissection in such cases. METHODOLOGY: Thirty-three consecutive patients with remnant stomach cancer and 44

consecutive patients primary gastric cancer in the upper third of the stomach were investigated retrospectively about lymphatic flow by injection of activated **carbon particles**, and about the incidence of **lymph node** metastasis. RESULTS: Lymphatic flow and the incidence of **lymph node** metastasis in remnant stomach cancer after distal gastrectomy without **lymph node** dissection were the same as those in primary gastric cancer in the upper third of the stomach. Lymphatic flow after distal gastrectomy with **lymph node** dissection frequently streamed toward the para-aortic **lymph nodes** through the **lymph nodes** along the greater curvature and the suprapancreatic **lymph nodes**. Lymphatic flow toward the jejunal and colonic mesentery was observed regardless of the method of reconstruction. This lymphogenesis was clearly observed, especially in patients with tumors invading the anastomosis site of Billroth-II reconstruction. Station Nos. 110 (lower paraesophageal) and 111 (supradiaphragmatic) **lymph nodes** were also stained, despite being considered sites of distant metastasis irrespective of the method of reconstruction. CONCLUSIONS: On the basis of the evidence of altered lymphatic flow and the incidence of **lymph node** metastases in remnant stomach cancer, left upper abdominal evisceration with para-aortic **lymph node** dissection should be performed in advanced remnant stomach cancer.

L31 ANSWER 5 OF 77 MEDLINE on STN
AN 2001544974 MEDLINE
DN 21476160 PubMed ID: 11591974
TI Lymphatic **mapping** improves staging during laparoscopic colectomy for cancer.
AU Wood T F; Spirt M; Rangel D; Shen P; Tsioulias G J; Morton D L; Bilchik A J
CS The John Wayne Cancer Institute, Saint John's Health Center, Department of Surgical Oncology, 2200 Santa Monica Boulevard, Santa Monica, CA 90404, USA.
NC T32 CA 09689 (NCI)
SO SURGICAL ENDOSCOPY, (2001 Jul) 15 (7) 715-9.
Journal code: 8806653. ISSN: 1432-2218.
CY Germany: Germany, Federal Republic of
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200202
ED Entered STN: 20011010
Last Updated on STN: 20030105
Entered Medline: 20020204
AB BACKGROUND: Recently, lymphatic **mapping** (LM) of the **sentinel lymph node** (SN) has been coupled with ultrastaging methods to diagnose nodal micrometastases from colorectal cancer (CRC). We have developed a technique for LM at the time of laparoscopic colon resection (LCR). METHODS: Between August 1996 and February 2000, 11 patients with small early-stage CRC underwent laparoscopic LM and LCR. The primary tumor/polyp site was visualized through a colonoscope and either tattooed preoperatively with a **carbon** dye (India **ink**), or stained intraoperatively by peritumoral injection of isosulfan blue dye. Immediately after intraoperative injection of blue dye, efferent lymphatic channels were visualized through the laparoscope and followed to the SN. Each blue-stained SN was marked with a suture or clip. RESULTS: In all 11 cases, laparoscopic LM identified between one and three SN draining the primary tumor. LM added 15-20 min to the operating time. The SN correctly reflected the nodal status of the entire specimen in all cases. In the one node-positive case, micrometastases were found only in an SN and only after cytokeratin immunohistochemistry (CK-IHC). In four cases, LM demonstrated unexpected primary lymphatic drainage that prompted an

increase in the margins of resection. CONCLUSIONS: LM during laparoscopic colectomy for CRC may be useful to mark the primary tumor site and to demonstrate lymphatic drainage that can alter the margins of resection. Focused examination of SN identifies occult micrometastases that up-stage CRC.

L31 ANSWER 6 OF 77 MEDLINE on STN
AN 2001458637 MEDLINE
DN 21395922 PubMed ID: 11505397
TI **Carbon** dye histologically confirms the identity of **sentinel lymph nodes** in cutaneous melanoma.
AU Haigh P I; Lucci A; Turner R R; Bostick P J; Krasne D L; Stern S L; Morton D L
CS Roy E. Coats Research Laboratories, Division of Surgical Oncology, John Wayne Cancer Institute at Saint John's Health Center, 2200 Santa Monica Blvd., Santa Monica, CA 90404, USA.
NC T32 CA 09689 (NCI)
SO CANCER, (2001 Aug 1) 92 (3) 535-41.
Journal code: 0374236. ISSN: 0008-543X.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 200108
ED Entered STN: 20010816
Last Updated on STN: 20010903
Entered Medline: 20010830
AB BACKGROUND: False-negative results from lymphatic **mapping** and **sentinel** lymphadenectomy (LM/SL) are associated with technical failures in nuclear medicine and surgery or with erroneous histologic evaluation. Any method that can confirm **sentinel lymph node** (SN) identity might decrease the false-negative rate. **Carbon** dye has been used as an adjunct to assist lymphadenectomy for some tumors, and the authors hypothesized that it could be used for the histologic verification of SNs removed during LM/SL. The current study assessed the clinical utility of **carbon** dye as a histopathologic adjunct for the identification of SNs in patients with melanoma and correlated the presence of **carbon particles** with the histopathologic status of the SNs. METHODS: LM/SL was performed using **carbon** dye (India **ink**) combined with isosulfan blue dye and sulfur colloid. Blue-stained and/or radioactive **lymph nodes** (two times background) were defined as SNs. **Lymph nodes** were evaluated for the presence of **carbon particles** and melanoma cells. If an SN lacked **carbon** dye in the initial histologic sections, four additional levels were obtained with S-100 protein and HMB-45 immunohistochemistry. Completion **lymph node** dissection (CLND) was performed if any SN contained melanoma cells. RESULTS: One hundred patients underwent successful LM/SL in 120 **lymph node** regions. **Carbon particles** were identified in 199 SNs from 111 **lymph node** regions of 96 patients. Sixteen patients had tumor-positive SNs, all of which contained **carbon particles**. The anatomic location of the **carbon particles** within these tumor-positive SNs was found to be correlated with the location of tumor cells in the SNs. The presence of **carbon particles** appeared to be correlated with blue-black staining (P = 0.0001) and with tumor foci (P = 0.028). All 35 non-SNs that were removed during LM/SL were tumor-negative, and only 2 contained **carbon particles**. Of the 272 non-SNs removed during CLND, 5 contained metastases; 3 of these 5 were the only non-SNs that had **carbon particles**. The use of **carbon particles** during LM/SL was found to be safe and nontoxic. CONCLUSIONS: **Carbon** dye used in LM/SL for melanoma permits the histologic confirmation of SNs. **Carbon**

particles facilitate histologic evaluation by directing the pathologist to the SNs most likely to contain tumor. The location of **carbon particles** within SNs may assist the pathologist in the detection of metastases, thereby decreasing the histopathologic false-negative rate of LM/SL and subsequently reducing the same-basin recurrence rate.

L31 ANSWER 10 OF 77 MEDLINE on STN
AN 2000309961 MEDLINE
DN 20309961 PubMed ID: 10851412
TI **Lymph-node** staining with activated **carbon** CH40: a new method for axillary **lymph-node** dissection in breast cancer.
AU Yokota T; Saito T; Narushima Y; Iwamoto K; Iizuka M; Hagiwara A; Sawai K; Kikuchi S; Kunii Y; Yamauchi H
CS Department of Surgery, Sendai National Hospital, Japan.. yokoyoko@jun.ncvc.go.jp
SO CANADIAN JOURNAL OF SURGERY, (2000 Jun) 43 (3) 191-6.
Journal code: 0372715. ISSN: 0008-428X.
CY Canada
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200006
ED Entered STN: 20000706
Last Updated on STN: 20000706
Entered Medline: 20000623
AB OBJECTIVE: To demonstrate the usefulness of activated **carbon particles** (CH40) as a vital staining dye for visualizing lymphatic vessels and **lymph nodes** in breast cancer. DESIGN: A retrospective evaluation. SETTING: Department of Surgery in Sendai National Hospital, Japan, a 716-bed teaching hospital. METHODS: To identify as many **lymph nodes** as possible in the axillary fat, by which we might decrease the possibility of the presence of undetected metastatic nodes, an emulsion of activated **carbon particles** (CH40) was injected into the centre of the mammary gland, close to the tumour site, 3 days before radical surgery. MAIN OUTCOME MEASURE: The number of **lymph nodes** found by the traditional method and by the CH40-injection method were recorded. RESULTS: After injection, the CH40 was readily adsorbed into regional lymphatics and streamed along with the lymph flow to blacken regional **lymph nodes**. The CH40-guided method increased the mean number of nodes per case found in the axilla from 8.4, by the traditional method, to 14.0 nodes per case. CONCLUSIONS: The use of the CH40 technique has two technical advantages; one is that it allows surgeons to locate the blackened **lymph nodes** at the time of surgery and the other is that it allows pathologists to look for the nodes in fatty tissue. **Lymph-node** dissection with the aid of activated **carbon particles** is inexpensive, easy to perform and enables the smallest **lymph nodes** to be easily recognized. CH40 is the technique of choice for the detection of axillary **lymph nodes** in cases where the number of **lymph nodes** detected by the traditional method is too small for accurate surgery. In conclusion, the present study demonstrates that CH40 could be an appropriate tool for more accurate staging of breast cancer axillary specimens.

L31 ANSWER 12 OF 77 MEDLINE on STN
AN 1999347146 MEDLINE
DN 99347146 PubMed ID: 10418592
TI **Carbon** dye as an adjunct to isosulfan blue dye for **sentinel lymph node** dissection.
AU Lucci A; Turner R R; Morton D L

CS Roy E. Coats Research Laboratories, John Wayne Cancer Institute, Saint John's Health Center, Santa Monica, CA 90404, USA.
SO SURGERY, (1999 Jul) 126 (1) 48-53.
Journal code: 0417347. ISSN: 0039-6060.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199908
ED Entered STN: 19990816
Last Updated on STN: 19990816
Entered Medline: 19990805
AB BACKGROUND: The success of intraoperative lymphatic **mapping** depends on accurate identification of the **sentinel** node. We hypothesized that a **carbon particle** suspension would allow histopathologic confirmation of the **sentinel lymph node** through deposition of **carbon** within that node. METHODS: An animal model was used to compare the lymphatic **mapping** accuracy of **carbon** dye with that of isosulfan blue dye, the standard agent for intraoperative visualization of the **sentinel lymph node**. Twenty-two rats underwent lymphatic **mapping** in each distal lower extremity with various combinations of **carbon** dye and isosulfan blue dye. All stained (blue or black) nodes in the inguinal drainage basin were removed for pathologic analysis, including **carbon particle** analysis. A meticulous search identified all nonstained (nonsentinel) nodes in the same basin. These nonsentinel nodes were examined for **carbon particles** by light microscopy. Dermal diffusion of **mapping** agents at the injection site was also recorded. Animals were then observed for 28 days to assess the toxicity of **mapping** agents. RESULTS: Although isosulfan blue dye and full-strength **carbon** dye each stained all **sentinel** nodes, the latter obscured histologic detail. The combination of 2.5% **carbon** dye, 7.5% saline solution, and 90% isosulfan blue dye also stained all **sentinel** nodes; **carbon particles** were seen on light microscopy in all 13 stained nodes and did not interfere with histologic evaluation. No unstained node contained **carbon particles**, although the number of nonsentinel nodes was small. **Carbon** dye exhibited significantly less intradermal diffusion than isosulfan blue dye, but the **carbon** left a permanent mark on the skin. No toxicity or side effect associated with the use of **carbon** dye was observed. CONCLUSION: **Carbon** dye allows histopathologic confirmation of **sentinel lymph nodes** identified by isosulfan blue dye.

L31 ANSWER 14 OF 77 MEDLINE on STN
AN 1999189817 MEDLINE
DN 99189817 PubMed ID: 10089947
TI Number and anatomical extent of **lymph node** metastases in gastric cancer: analysis using intra-**lymph node** injection of activated **carbon particles** (CH40).
AU Okamoto K; Sawai K; Minato H; Yada H; Shirasu M; Sakakura C; Otsuji E; Kitamura K; Taniguchi H; Hagiwara A; Yamaguchi T; Takahashi T
CS First Department of Surgery, Kyoto Prefectural University of Medicine, Japan.. okamoto@1surg.kpu-m.ac.jp
SO JAPANESE JOURNAL OF CLINICAL ONCOLOGY, (1999 Feb) 29 (2) 74-7.
Journal code: 0313225. ISSN: 0368-2811.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199904
ED Entered STN: 19990413
Last Updated on STN: 19990413

Entered Medline: 19990401

AB BACKGROUND: The long-term survival of 200 patients with gastric cancer who underwent radical gastrectomy was analyzed with respect to the number and anatomical extent of **lymph node** metastasis. All of the patients received intra-**lymph node** injection of fine activated **carbon particle** solution (CH40) during surgery. METHODS: The average number of resected **lymph nodes** increased in line with the anatomical level of **lymph node** dissection; 32.5 per patient in D1, 42.3 in D2, 3 and 66.3 in D4. The percentage of blackened **lymph nodes** without metastasis (42.4%) was slightly higher than that of **lymph nodes** containing metastasis (37.2%), but the difference was not statistically significant. Of the 200 patients, 61 (30.5%) had microscopic evidence of metastatic **lymph node** involvement. Twenty-two patients had between one and three metastatic **lymph nodes**, 19 had between four and nine and 20 patients had more than nine. The 5-year survival rate was 93.1% in patients without **lymph node** metastasis, 71.9% in patients with 1-8 metastatic nodes, 36.1% in patients with 4-9 nodes and 19.2% in patients with > 9 nodes. RESULTS: The 5-year survival rate according to the anatomical extent of metastatic **lymph nodes** was 93.1% in n0, 63.1% in n1, 37.9% in n2, 27.8% in n3 and 0% in n4. The number of metastatic **lymph nodes** and also their anatomical extent were identified as independent prognostic factors for survival by multivariate analysis. CONCLUSION: The number and anatomical extent of metastatic **lymph nodes** have similar impacts on prognosis in gastric cancer.

L31 ANSWER 16 OF 77 MEDLINE on STN
AN 1999046967 MEDLINE
DN 99046967 PubMed ID: 9831104
TI Prospective randomized evaluation of preoperative endoscopic vital staining using CH-40 for **lymph node** dissection in gastric cancer.
CM Comment in: Ann Surg Oncol. 1998 Oct-Nov;5(7):563-4
AU Catarci M; Guadagni S; Zaraca F; Pistoia M A; Mastracchio A; Trecca A; Ruco L; Carboni M
CS Division of General Surgery, School of Medicine, University of Rome La Sapienza, Italy.
SO ANNALS OF SURGICAL ONCOLOGY, (1998 Oct-Nov) 5 (7) 580-4.
Journal code: 9420840. ISSN: 1068-9265.
CY United States
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
(RANDOMIZED CONTROLLED TRIAL)
LA English
FS Priority Journals
EM 199902
ED Entered STN: 19990216
Last Updated on STN: 19990216
Entered Medline: 19990204

AB BACKGROUND: CH-40 is a suspension of activated **carbon particles** that was developed in Japan to carry anticancer drugs to regional nodes and peritoneal seedings of gastric cancer. METHODS: Forty-five consecutive patients who had surgical resection and D2 **lymph node** dissection for gastric cancer over a 2-year period were randomly assigned to preoperative endoscopic submucosal injection of CH-40 (group A) or no staining (group B). A total of 21 patients in group A and 24 in group B were available for analysis. RESULTS: The number of resected nodes per patient was significantly higher ($t = 6.06$; 40 df; $P < .0001$) in group A (mean+/-S.E. = 35.3+/-1.24) than in group B (mean+/-S.E. = 25.5+/-1.02). The rate of metastatic nodes resected was significantly higher ($chi2 = 6.903$; 1 df; $P = .009$) in stained (22.5%) than in non-stained (14.7%) nodes of group A and also

(chi2 = 6.906; 1 df; P = .009) in stained nodes of group A than in group B (15.8%). CONCLUSIONS: Preoperative endoscopic vital staining with CH-40 proved to be rapid, safe, and effective in all cases in this series. Its use allowed surgeons to resect a higher number of **lymph nodes**. and to identify and examine more metastatic nodes. It also permitted identification of nodal micrometastases on routine histopathologic examination.

L31 ANSWER 20 OF 77 MEDLINE on STN
AN 1998018636 MEDLINE
DN 98018636 PubMed ID: 9382535
TI Visualising **lymph nodes** by aclarubicin bound to activated **carbon particles** in breast cancer surgery.
AU Imanishi T; Hagiwara A; Sawai K; Yamaguchi T; Sakakura C; Shirasu M; Ohgaki M; Yamasaki J; Togawa T; Takahashi T
CS First Dept. of Surgery, Kyoto Prefectural University of Medicine.
SO GAN TO KAGAKU RYOHO [JAPANESE JOURNAL OF CANCER AND CHEMOTHERAPY], (1997 Sep) 24 (12) 1796-8.
Journal code: 7810034. ISSN: 0385-0684.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 199711
ED Entered STN: 19971224
Last Updated on STN: 19971224
Entered Medline: 19971107
AB A new dosage formulation (ACR-CH), composed of aclarubicin (ACR) bound to fine activated **carbon particles**, has been developed for the treatment of **lymph node** metastases in breast cancer. ACR-CH is designed to (a) adsorb a great amount of aclarubicin and desorb in a free state; (b) distribute a greater amount of ACR for a longer period of time selectively to the regional **lymph nodes**; (c) be decreased in the systemic toxicity; and (d) enhance its therapeutic effect on **lymph node** metastases. In this clinical trial in 20 patients with breast cancer, ACR-CH was injected intra- and peritumorally just before operation for breast cancer, and we examined the extent of blackened nodes produced by ACR-CH. ACR-CH blackened about 70% of the axillary **lymph nodes** with cancer metastasis as well as the nodes without metastasis. In conclusion, ACR-CH will be useful for dissection of **lymph nodes** by visualizing the nodes during operation for breast cancer.

L31 ANSWER 25 OF 77 MEDLINE on STN
AN 97000120 MEDLINE
DN 97000120 PubMed ID: 8843263
TI Visualization of routes of lymphatic drainage of the gallbladder with a **carbon particle** suspension.
AU Uesaka K; Yasui K; Morimoto T; Torii A; Yamamura Y; Kodera Y; Hirai T; Kato T; Kito T
CS Department of Gastroenterological Surgery, Aichi Cancer Center, Nagoya, Japan.
SO JOURNAL OF THE AMERICAN COLLEGE OF SURGEONS, (1996 Oct) 183 (4) 345-50.
Journal code: 9431305. ISSN: 1072-7515.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199611
ED Entered STN: 19961219
Last Updated on STN: 19961219
Entered Medline: 19961113
AB BACKGROUND: Although carcinoma of the gallbladder frequently spreads lymphatically, few reports exist about the evaluation of routes of

lymphatic drainage of the gallbladder by vital staining. The purpose of this study was to visualize drainage routes and the extent of lymphatic flow from the gallbladder by using vital staining with a **carbon particle** suspension (CH40). STUDY DESIGN: In 20 patients, 0.3 to 0.5 mL of **carbon particle** suspension was injected into first station nodes for the gallbladder, the cystic node or pericholedochal node, intraoperatively. After a Kocher maneuver was performed, **lymph nodes** and lymphatic vessels blackened by the stain were visualized macroscopically. RESULTS: Lymphatic pathways from the gallbladder were classified into three routes: right, left, and hilar. The right route, which ran along the common bile duct to the superior retropancreaticoduodenal node or the retroportal node and reached the para-aortic nodes, was stained in 95 percent of patients. The left route, which traveled toward **lymph nodes** medial to the hepatoduodenal ligament through the posterior aspect of the head of the pancreas, was stained in less than 50 percent of patients. Among **lymph nodes** along the left route, the posterior common hepatic node was most frequently stained (45 percent). The hilar route, which ascended toward the hepatic hilus, was stained in 20 percent of patients. CONCLUSIONS: These data demonstrate that the right route is a main pathway of lymphatic drainage from the gallbladder, while the left and hilar routes are branch lines. The para-aortic nodes, regarded as final regional nodes for the gallbladder, should be removed during radical surgery for advanced carcinoma of the gallbladder. Drainage along the hilar route may cause metastasis to the liver.

L31 ANSWER 27 OF 77 MEDLINE on STN
AN 96331344 MEDLINE
DN 96331344 PubMed ID: 8702308
TI Rationale of **lymph node** dissection for breast cancer--from the viewpoint of analysis of axillary lymphatic flow using activated **carbon particle** CH40.
AU Sawai K; Hagiwara A; Shimotsuma M; Sakakibara T; Imanishi T; Takemoto Y; Takahashi T
CS First Dept. of Surgery, Kyoto Prefectural University of Medicine, Japan.
SO GAN TO KAGAKU RYOHO [JAPANESE JOURNAL OF CANCER AND CHEMOTHERAPY], (1996 Mar) 23 Suppl 1 30-5.
Journal code: 7810034. ISSN: 0385-0684.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199608
ED Entered STN: 19960912
Last Updated on STN: 19960912
Entered Medline: 19960830
AB In order to rationalize **lymph node** dissection for breast cancer, we reviewed regional lymphatic flow from the mesial and outer half of the breast using intra-tumoral injection of activated **carbon particles** (CH40). Seventy patients with breast cancer were included in this study. Cancers were located in the mesial half of the breast in 25 cases and in its outer half in 41 cases. Since regional **lymph nodes** were blackened by CH40, **lymph node** dissection was performed easily and small **lymph nodes** could be readily examined. The average number of resected nodes in each case was 29.4. When CH40 was injected into the mesial half of the breast, the rates of blackened nodes (number of macroscopically blackened **lymph nodes**/number of total removed **lymph nodes**) in the stations were 46.6% (No. 1a), 41.4% (No. 1b), 62.1% (No. 1c), 61.8% (No. 2), 69.2.% (No. 2h), and 65.6% (No. 3). When CH40 was injected into outer half of the breast, those were 62.0% (No. 1a), 64.3% (No. 1b), 68.7% (No. 1c), 75.3% (No. 2), and 67.8% (No. 2h). Regardless of tumor location, the rates of blackened nodes were high in each station. In conclusion, regardless of tumor

location it is impossible to determine the level of axillary dissection for breast cancer. It should be all or nothing.

L31 ANSWER 32 OF 77 MEDLINE on STN
AN 95338679 MEDLINE
DN 95338679 PubMed ID: 7613940
TI Activated **carbon**-oriented gastrectomy for early gastric cancer.
AU Kitamura K; Hagiwara A; Otsuji E; Shimotsuma M; Taniguchi H; Yamaguchi T; Sawai K; Takahashi T
CS First Department of Surgery, Kyoto Prefectural University of Medicine, Kyoto, Japan.
SO BRITISH JOURNAL OF SURGERY, (1995 May) 82 (5) 647-50.
Journal code: 0372553. ISSN: 0007-1323.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199508
ED Entered STN: 19950905
Last Updated on STN: 19950905
Entered Medline: 19950822
AB Twenty-two patients with early gastric cancer received injections of activated **carbon particles** (CH-40) to identify during surgery the location of non-palpable tumours present in the upper portion of the stomach. A few days before surgery, 0.2 ml of CH-40 was injected endoscopically into the gastric muscle adjacent to the cancer. In 20 of the 22 patients, the CH-40-stained area was recognized as a blackened patch on the serosal surface of the stomach which indicated the location of the non-palpable cancer tissue. The surgical margin for gastrectomy was defined as the proximal margin of the **carbon**-stained area and gastrectomies were performed on the 22 patients. CH-40 injection made it possible to choose the extent of **lymph node** dissection.

L31 ANSWER 33 OF 77 MEDLINE on STN
AN 95223303 MEDLINE
DN 95223303 PubMed ID: 7708047
TI Study on feeding arteries and lymphatic drainage of remnant stomach cancer using angiography and fine activated **carbon particles**.
AU Kato M
CS First Department of Surgery, Kyoto Prefectural University of Medicine, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1995 Feb) 96 (2) 80-7.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 199505
ED Entered STN: 19950518
Last Updated on STN: 19950518
Entered Medline: 19950509
AB Preoperative angiography was performed on 29 patients with remnant stomach cancer. The tumor vessels of the remnant stomach cancer were angiographically identified in 25 patients whose left gastric artery had been left intact (11 cases) or removed (14 cases) in their last operation. **Lymph node** metastases were examined in relation to the tumor vessels in 96 cases of initial cancer in the upper third of the stomach. Fine activated **carbon particles** (CH40) were endoscopically injected into the submucosal layer of the stomach in 13 patients with remnant stomach cancer two days before their operation. Blackening of the **lymph nodes** by CH40 was observed and the effect of removing the left gastric artery on lymphatic drainage was

analyzed. Findings from these studies are summarized as follows: In cases of remnant stomach cancer where the left gastric artery was left intact, the tumor vessels most often included the left gastric artery and lymphatic drainage proceeded mainly through the left gastric artery and branches of the splenic artery (the posterior gastric artery, the left gastroepiploic artery, and the short gastric artery) to the para-aortic **lymph nodes**. In cases where the left gastric artery was removed, the tumor vessels were made up of branches of the splenic artery and lymphatic drainage was mainly through branches of the splenic artery to the para-aortic **lymph nodes**.

L31 ANSWER 39 OF 77 MEDLINE on STN
AN 94147334 MEDLINE
DN 94147334 PubMed ID: 8313317
TI Clinical study of lymphatic flow to the paraaortic **lymph nodes** in carcinoma of the head of the pancreas.
AU Nagakawa T; Kobayashi H; Ueno K; Ohta T; Kayahara M; Miyazaki I
CS Second Department of Surgery, Kanazawa University, School of Medicine, Ishikawa, Japan.
SO CANCER, (1994 Feb 15) 73 (4) 1155-62.
Journal code: 0374236. ISSN: 0008-543X.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Abridged Index Medicus Journals; Priority Journals
EM 199403
ED Entered STN: 19940330
Last Updated on STN: 19940330
Entered Medline: 19940321
AB BACKGROUND. At Kanazawa University, the authors have been developing an appropriate radical operation for the treatment of cancer of the head of the pancreas. As a result of previous research, it was believed that lymphatic metastasis of carcinoma of the head of the pancreas should be investigated more thoroughly to improve the surgical results. METHODS. Forty-two cases of carcinoma of the head of the pancreas were investigated to determine the distribution of lymphatic metastases. From among these cases, the authors injected activated **carbon particles** in 10 patients with pancreatic cancer and 111In colloid in seven patients with pancreatoduodenal cancer to investigate the lymphatic spread from the head of the pancreas to the paraaortic **lymph nodes** (area 16). RESULTS. The main lymphatic route from the head of the pancrease to lymphatic area 16 was found to pass through the nodes in the posterior part of the head of the pancrease (area 13) and around the superior mesenteric artery (area 14). Lymphatic metastases in area 16 were seen mainly in the lower segment of the middle region from the celiac artery to the inferior mesenteric artery (subarea 16b2). The **carbon** and 111In colloid flowed mostly to the same area 16 **lymph nodes** and toward the dorsal side of the renal artery rather than spreading superficially along the abdominal aorta. CONCLUSIONS. These results indicate that area 16 **lymph node** dissection should be extended toward the dorsal side of the renal artery rather than be performed widely along the abdominal aorta to make the radical operation for pancreatic cancer more extensive.

L31 ANSWER 40 OF 77 MEDLINE on STN
AN 94046313 MEDLINE
DN 94046313 PubMed ID: 7693905
TI Lymphatic drainage of adrenal neuroblastoma.
AU Tokiwa K; Nakamura K; Ogita S; Iwai N; Hagiwara A; Takahashi T
CS Division of Surgery, Children's Research Hospital, Kyoto Prefectural University of Medicine, Japan.
SO JOURNAL OF PEDIATRIC SURGERY, (1993 Jul) 28 (7) 927-9.
Journal code: 0052631. ISSN: 0022-3468.
CY United States

DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199312
ED Entered STN: 19940117
Last Updated on STN: 19960129
Entered Medline: 19931207
AB The lymphatic drainage of adrenal neuroblastoma (NB) was investigated in 11 patients using intraoperative vital staining with **carbon particle** suspension. **Carbon** staining was most frequent in the nodes at the origin of the renal artery and next most frequent in the interaorticovenous nodes. The staining was characteristically noted in the paraaortic nodes and the nodes around the hemiazygos vein in cases of left adrenal NB, and in the paracaval nodes and the nodes around the azygos vein in cases of right adrenal NB. Histological evaluation confirmed a correlation with **lymph node** metastases and **carbon** staining. These findings suggest that the primary regional nodes of adrenal NB are the nodes at the origin of the renal artery, those around the hemiazygos vein in left adrenal NB, and those around the azygos vein in right adrenal NB. The secondary regional nodes are the interaorticovenous nodes, the paraaortic nodes in left adrenal NB, and the paracaval nodes in right adrenal NB. The topography of lymphatic drainage of adrenal NB should be considered in the management of this tumor.

L31 ANSWER 41 OF 77 MEDLINE on STN
AN 93318578 MEDLINE
DN 93318578 PubMed ID: 8328261
TI Evaluation of the lymphatic dissection at the operation of carcinoma of the thoracic esophagus applying the **carbon particle** (CH 40) for black-staining of the **lymph nodes** as a guide.
AU Madokoro S; Kumashiro R
CS Second Department of Surgery, School of Medicine, Fukuoka University, Japan.
SO IGAKU KENKYU. ACTA MEDICA, (1993 Feb) 63 (1) 5-14.
Journal code: 0421144. ISSN: 0076-597X.
CY Japan
DT (CLINICAL TRIAL)
Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 199308
ED Entered STN: 19930820
Last Updated on STN: 19930820
Entered Medline: 19930811
AB We have injected emulsion of activated **carbon particles** (CH 40), into the mediastinal **lymph nodes** at the bifurcation of trachea and examined whether **carbon** impregnated black **lymph node** is useful as a guide for more accurate and more appropriate lymphadenectomy at the esophagectomy. The patients subjected to our study were 112 patients with carcinoma of esophagus experienced from 1974 to 1991. Among them, 20 cases underwent 3-field **lymph nodes** dissection with CH 40 (CH group) and as control groups 41 cases received 2-field lymphadenectomy (2-F group), and 51 patients received 3-field lymphadectomy without CH 40 (3-F group). The average numbers of the **lymph nodes** dissected in CH group (24.5) was significantly larger in comparison with 2-F group (9.1) and 3-F group (10.5) ($p < 0.05$). The rate of the number of metastatic **lymph nodes** per number of **lymph nodes** dissected in the mediastinum in CH group (55.0%) was higher in those of 2-F group (24.3%) and 3-F group (33.3%). Postoperative pulmonary complications were observed in 20% in the of CH group, but in 41% of 2-F group and 60.0% in 3-F group. Cumulative 3-year survival rate in CH group was better than others. Therefore, it was concluded that the

3-field lymphadenectomy with CH group was useful in the operation of the carcinoma of the esophagus to improve the prognosis and decreasing the postoperative pulmonary complications.

L31 ANSWER 43 OF 77 MEDLINE on STN
AN 93113135 MEDLINE
DN 93113135 PubMed ID: 1282054
TI Radical lymphadenectomy for rectal cancer facilitated by a **carbon particle** infusion lymphangiography.
AU Kumashiro R; Sano C; Sakai T; Ugaeri H; Madokoro S; Yamazaki S; Inutsuka S; Takahashi T
CS Second Department of Surgery, School of Medicine, Fukuoka University, Japan.
SO SURGERY TODAY, (1992) 22 (6) 512-6.
Journal code: 9204360. ISSN: 0941-1291.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199302
ED Entered STN: 19930219
Last Updated on STN: 19960129
Entered Medline: 19930203
AB For the intraoperative visualization of the para-aortic nodes and those around the iliac vessels, a fine **carbon particle** solution was infused into the bilateral pedal lymphatic vessels of 12 patients with rectal carcinoma. A low anterior resection with radical **lymph node** dissection was then performed while preserving pelvic autonomic nerves. Of 444 **lymph nodes** removed from the iliac arterial region, 430 were stained with **carbon** black (96.8%), even though the black staining was not perfect in the nodes of the inferior mesenteric arterial region. All of the lateral black stained nodes were clearly visible and hence could be easily excised. The average number of dissected nodes in one patient was 43.8 in this dissection with **carbon particle** infusion, which was larger than those of conventional **lymph node** dissection. We then examined the length of time that a postoperative indwelling bladder catheter was needed as an indication for autonomic nerve damage, and it was ascertained that less damage occurred in this operation compared to other types of dissections, such as conventional or extended **lymph node** dissection.

L31 ANSWER 45 OF 77 MEDLINE on STN
AN 93022878 MEDLINE
DN 93022878 PubMed ID: 1383647
TI Lymph nodal vital staining with newer **carbon particle** suspensions compared with India **ink**: experimental and clinical observations.
AU Hagiwara A; Takahashi T; Sawai K; Iwamoto A; Shimotsuma M; Yoneyama C; Seiki K; Itoh M; Sasabe T; Lee M
CS First Department of Surgery, Kyoto Prefectural University of Medicine, Japan.
SO LYMPHOLOGY, (1992 Jun) 25 (2) 84-9.
Journal code: 0155112. ISSN: 0024-7766.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199211
ED Entered STN: 19930122
Last Updated on STN: 19960129
Entered Medline: 19921117
AB CH40 and CH1500AA are newly prepared **carbon** suspensions which were examined as vital staining dyes for their usefulness in visualizing

lymphatics at operation and to blacken **lymph nodes**. In mice, these **carbon** suspensions at 0.001 ml/g of body weight and India **ink** were injected subcutaneously into the footpad of the right hindpaw. Regional **lymph nodes** were visualized and were examined stereomicroscopically to determine how intensely these nodes blackened with **carbon** suspensions. Compared with India **ink**, CH40 and CH1500AA blackened the regional **lymph nodes** much faster and more vividly (1-8 min. after subcutaneous injection). As analyzed by centrifugal **particle** size distribution, CH40 and CH1500AA are narrowly distributed with a small **particle** size (150 and 167 nm, respectively, in mean diameter). By contrast, India **ink** is comprised of widely distributed and relatively large **particles** in suspension (mean diameter--254 nm). In 10 patients undergoing radical gastrectomy for treatment of stomach cancer, CH40 blackened 69% of regional **lymph nodes** with metastases (38 of 55) and 76% of those nodes without metastases (387 of 512).

L31 ANSWER 50 OF 77 MEDLINE on STN
AN 92056830 MEDLINE
DN 92056830 PubMed ID: 1949863
TI Indications for pylorus preserving gastrectomy for early gastric cancer located in the middle third of the stomach.
AU Kodama M; Koyama K
CS Department of Surgery, Akita University School of Medicine, Japan.
SO WORLD JOURNAL OF SURGERY, (1991 Sep-Oct) 15 (5) 628-33; discussion 633-4. Journal code: 7704052. ISSN: 0364-2313.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199112
ED Entered STN: 19920124
Last Updated on STN: 19920124
Entered Medline: 19911226
AB Both basic and clinical studies were undertaken to determine the indications for pylorus preserving gastrectomy for patients with early gastric cancer located in the middle third of the stomach. This procedure is different from conventional subtotal gastrectomy in that it retains a 1.5 cm length of the pyloric cuff and it neglects to dissect the suprapyloric **lymph node**, with the remaining pyloric branch of the vagal nerve being preserved. Therefore, it is essential that this limited operation be performed only in cases without metastasis to the suprapyloric **lymph node**. The distance from the caudal end of the tumor to the cut edge is far enough when the tumor is in the middle third of the stomach. The direction of lymph flow, as determined in 14 cases by activated **carbon particles** (CH-40), suggests that there is limited lymph flow towards the suprapyloric **lymph node** from the middle third of the stomach. **Lymph node** involvement was investigated in 154 patients with early gastric cancer located in the middle third of the stomach who had undergone conventional subtotal gastrectomy with regional **lymph node** dissection between 1976 and 1989. By analysis of the relationship between **lymph node** metastasis and the clinicopathologic findings revealed before operation, i.e. gross appearance, histological classification, and tumor size, the indications for pylorus preserving gastrectomy were determined as follows: (1) any case with tumors smaller than 2.0 cm in maximum length, and (2) cases with a tumor of 2.0 to 4.0 cm if it is a mucosal cancer, if it is located at the greater curvature, or if it is an elevated type IIa cancer. This operation has been performed on 11 patients to date without postoperative complaints or sequelae.

L31 ANSWER 51 OF 77 MEDLINE on STN

AN 92049176 MEDLINE
DN 92049176 PubMed ID: 1944177
TI Evaluation of rational **lymph node** dissection for abdominal neuroblastoma.
AU Tokiwa K; Iwai N; Ogita S; Hagiwara A; Sawai K; Takahashi T
CS Division of Surgery, Children's Research Hospital, Kyoto, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1991 Sep) 92 (9) 1159-62.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 199112
ED Entered STN: 19920124
Last Updated on STN: 19920124
Entered Medline: 19911223
AB Complete tumor resection has a significant role in the treatment of localized neuroblastoma. Recently we have applied activated **carbon particles** to **lymph node** dissection in the surgery of retroperitoneal neuroblastoma with nodal involvement for the complete resection of this tumor. In this study, we have reviewed 22 consecutive patients with retroperitoneal neuroblastoma who received rational **lymph node** dissection using activated **carbon particles** from 1985 through 1990, including 16 patients detected through mass screening. Fourteen patients with stages I, II, and IV-S of neuroblastoma have survived for a median duration of 37.6 months, and all patients detected through mass screening survived for a median duration of 36.7 months, with no evidence of disease after operation. Two of the 8 patients with advanced disease (stages III and IV) died of tumor progression. No local recurrence was observed in all patients, and early or late complications were minimal. In conclusion, rational **lymph node** dissection considering the lymphatics is recommended for the surgery of patients with retroperitoneal neuroblastoma, including the patients detected through mass screening.

L31 ANSWER 52 OF 77 MEDLINE on STN
AN 92049150 MEDLINE
DN 92049150 PubMed ID: 1944152
TI A clinical study on metastasis to para-aortic **lymph nodes** in cancer of the head of the pancreas.
AU Kobayashi H
CS Department of Surgery II, School of Medicine, Kanazawa University, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1991 Aug) 92 (8) 986-96.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 199111
ED Entered STN: 19920124
Last Updated on STN: 19920124
Entered Medline: 19911126
AB In order to investigate lymphatic spread from the head of the pancreas to the para-aortic **lymph nodes** (No. 16 area), lymphatic metastases were reviewed in 42 cases of carcinoma of the head of the pancreas, and then activated **carbon particles** and 111In colloid were injected in 10 cases and 7 cases of pancreatoduodenal cancer, respectively. The main route from the head of the pancreas to No. 16 area was a lymphatic pathway through the **lymph nodes** in the posterior part of the head of the pancreas (No. 13), around the superior mesenteric artery (No. 14) and No. 16. The lymphatic metastases

in No. 16 area were mainly seen in the area of 16b2. The **carbon** or 111In colloid also flowed to nearly the same **lymph nodes** of No. 16 area. The direction of the extent of those substances was especially toward the dorsal side of the level of the renal artery rather than from the rostral to the caudal. These results indicate that **lymph nodes** of No. 16 area should be dissected en bloc to the dorsal side of the level of the renal artery rather than from the rostral to the caudal in order to improve the radicality of the operation for pancreatic cancer.

L31 ANSWER 57 OF 77 MEDLINE on STN
AN 90066252 MEDLINE
DN 90066252 PubMed ID: 2586409
TI Rationalization of **lymph node** dissection for gastric cancer using small sized activated **carbon particles** adsorbing absolute ethanol.
AU Sawai K; Seiki K; Taniguchi H; Yokota T; Hagiwara A; Yamaguchi T; Takahashi T
CS First Department of Surgery, Kyoto Prefectural University of Medicine, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1989 Sep) 90 (9) 1310-3.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 198912
ED Entered STN: 19900328
Last Updated on STN: 19980206
Entered Medline: 19891227
AB CH40 is five percent saline solution of the activated **carbon particles** with 20nm in diameter. It can absorb a large amount of ethanol. CH40 reach to the regional **lymph nodes** immediately after local injection, visualize the regional **lymph nodes** black in color and release ethanol in the metastatic **lymph nodes**. As the direction of **lymph nodes** staining was coincident with direction of metastasis, rationalization of **lymph nodes** dissection could be performed as follows: 1) When **lymph nodes** metastasis are found along the lesser curvature, dissection of **lymph nodes** in the hepatoduodenal ligament should be carried out. 2) When **lymph nodes** metastasis are found in the infrapyloric region, dissection of **lymph nodes** along the splenic artery, in the hepatoduodenal ligament, at the posterior aspect of the pancreas, and at the root of the mesenterium should be carried out. 3) When **lymph nodes** metastasis are found along the left gastric artery, the common hepatic artery, or the splenic artery, dissection of para-aortic **lymph nodes** should be carried out.

L31 ANSWER 59 OF 77 MEDLINE on STN
AN 89127106 MEDLINE
DN 89127106 PubMed ID: 3221822
TI Study on the lymphatic flow of the lower gastric region for radical lymphadenectomy in advanced lower gastric cancer.
AU Kodama M; Ishikawa K; Koyama H; Narisawa T; Koyama K
CS First Department of Surgery, Akita University School of Medicine, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1988 Jul) 89 (7) 1008-13.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese

FS Priority Journals
EM 198903
ED Entered STN: 19900308
Last Updated on STN: 19900308
Entered Medline: 19890314
AB A prognosis of patients with a curative resected advanced cancer of the lower gastric region was worse than that of the other region of the stomach. The 5 year survival rate was only 47.3%. One of the main reasons was that a rate of **lymph node** recurrence was higher. In this point of view, we studied on lymphatic flow of the lower gastric region using an activated **carbon particle** (CH40). **Lymph nodes** were stained black soon after the injection of CH40 into the lower gastric wall at laparotomy. The black stained rate of an each regional **lymph node** was as follows. 3. 58%, 4. 17%, 5. 50%, 6. 25%, 1. 21%, 7. 58%, 8. 83%, 9. 58%, 11. 17% and 12. 33% in case of injection into the greater curvature and and 4. 31%, 6. 100%, 8. 25%, 9. 25%, 14V and 56% in case of injection into the lesser curvature. The stained rate was relatively high in 12 and 14V **lymph node** which we had not routinely dissected. The rates of **lymph nodes** stained black were related to those of cancer metastasis. The results suggest that lymphadenectomy of 12 for the cancer at the lesser curvature and that of 14V for the cancer at the greater curvature might make a prognosis of lower gastric cancer better.

L31 ANSWER 61 OF 77 MEDLINE on STN
AN 88318559 MEDLINE
DN 88318559 PubMed ID: 3412300
TI Studies on gastric lymphatics by using activated **carbon particle** (CH44) and **lymph node** metastasis of gastric cancer.
AU Yoshida K; Ohta K; Ohhashi I; Nakajima T; Takagi K; Nishi M
CS Department of Surgery, Cancer Institute Hospital, Tokyo, Japan.
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1988 May) 89 (5) 664-70.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 198809
ED Entered STN: 19900308
Last Updated on STN: 19900308
Entered Medline: 19880929
AB Gastric lymphatics in 200 patients of gastric cancer were studied by injection of activated **carbon particles** (CH44). By observing the **carbon** flow intraoperatively and examining stained **lymph nodes**, gastric lymphatics for individual regions (cardia, lesser curvature, left greater curvature and right greater curvature) were evaluated. The cardiac orifice has a main series of lymphatics along the left gastric artery and also has other lymphatics along the splenic artery, left phrenic artery, esophagus, lesser omentum and diaphragm. The left greater curvature depends on the lymph flow along the splenic artery. The lesser curvature has a main lymphatic stream along the left gastric artery. The right greater curvature has convened lymphatics around pancreatic head. Most streams gather around celiac axis, while the flow along right gastro-epiploic vein is also important. We also studied the relationship between the site of gastric cancer and metastasis is to the **lymph nodes** in 1097 gastrectomized patients. They had received more than R2 lymphatic dissection successfully. In the cases with lesions located in the upper part of the stomach, n4 (positive findings of metastasis to group 4 **lymph nodes**) is greater than n3 (positive findings of metastasis to group 3 **lymph nodes**). We concluded that

most of gastric lymphatics run along the proper gastric vessels and gathered around celiac axis. For **lymph node** dissection in gastric cancer, it is important to know the direction of the gastric lymphatics based on tumor sites.

L31 ANSWER 64 OF 77 MEDLINE on STN
AN 88187487 MEDLINE
DN 88187487 PubMed ID: 2451701
TI A study on **lymph-node** dissection using activated **carbon particles** (CH 44) in the modified radical mastectomy.
AU Kitamura M; Tominaga T; Hayashi K; Takahashi I; Kosaki G
SO NIPPON GAN CHIRYO GAKKAI SHI. JOURNAL OF JAPAN SOCIETY FOR CANCER THERAPY, (1987 Oct 20) 22 (9) 2231-8.
Journal code: 7505713. ISSN: 0021-4671.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 198805
ED Entered STN: 19900308
Last Updated on STN: 19960129
Entered Medline: 19880516

L31 ANSWER 66 OF 77 MEDLINE on STN
AN 87144203 MEDLINE
DN 87144203 PubMed ID: 3821714
TI Studies on para-aortic metastatic **lymph nodes** in gastric cancer after endoscopic injection of activated **carbon particles**.
AU Takahashi S; Takahashi T; Sawai K; Hagiwara A; Tokuda H; Kato G; Takenaka A
SO NIPPON GEKA GAKKAI ZASSHI. JOURNAL OF JAPAN SURGICAL SOCIETY, (1987 Jan) 88 (1) 35-40.
Journal code: 0405405. ISSN: 0301-4894.
CY Japan
DT Journal; Article; (JOURNAL ARTICLE)
LA Japanese
FS Priority Journals
EM 198704
ED Entered STN: 19900303
Last Updated on STN: 19900303
Entered Medline: 19870415
AB When activated **carbon particles** are injected into the tissues, they are absorbed into the lymphatic capillary and reach to the regional **lymph nodes**. Utilising this property of the activated **carbon**, we injected small sized **carbon particles** (CH-44) around the gastric cancer using endoscope to examine para-aortic **lymph node** metastasis. Sixty eight patients with gastric cancer existing serosal invasion were subjected to extended radical gastrectomy dissecting para-aortic **lymph nodes** as well as regional **lymph nodes**. Twenty patients (29.4%) had para-aortic **lymph node** metastasis. Cumulative 5-year survival rate of these patients after surgery was 20.0 per cent. High incidence of metastasis in para-aortic **lymph nodes** was found in the **lymph nodes** larger than 4mm in diameter, but 15.9 per cent of **lymph nodes** less than 2mm in diameter had metastasis. Large **lymph nodes** occupied almost wholly by cancer cells were stained scarcely by activated **carbon particles**, but **lymph nodes** with moderate or slight metastasis were stained black well and this method was very useful for **lymph node** dissection, even for micro-**lymph nodes** which seemed to escape from naked eye at

surgery.

L31 ANSWER 71 OF 77 MEDLINE on STN
AN 84178921 MEDLINE
DN 84178921 PubMed ID: 6424695
TI Proliferative patterns of lymphocytes in **lymph nodes** during tumour development: involvement of T and B cell areas.
AU Bertschmann M; Markwalder-Hartenbach R; Pedrinis E; Hess M W; Cottier H
SO BRITISH JOURNAL OF CANCER, (1984 Apr) 49 (4) 477-84.
Journal code: 0370635. ISSN: 0007-0920.
CY ENGLAND: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 198406
ED Entered STN: 19900319
Last Updated on STN: 19900319
Entered Medline: 19840605
AB DNA-synthetizing lymphocytes were identified in the **lymph nodes** regional and more distal to the site of developing P-815 tumours by incorporation of [3H]-thymidine followed by autoradiography of **lymph node** sections. It appeared that not only T but also B cell areas of draining and to a lesser extent of distal **lymph nodes** were stimulated by the growing tumour. This result was unexpected since neither humoral nor tumour cell-bound antibody could be identified so far as a functional correlate of B cell stimulation. In general the proliferative response of lymphocytes followed a biphasic pattern with an early peak of reactivity on days 2-3 and a second peak around day 12-15 after tumour cell inoculation. In the draining (axillary) **lymph node** the second peak of reactivity was suppressed, possibly as a consequence of metastatic tumour cells in this node when tumour cells were inoculated in the flank. The pattern of lymphocyte stimulation revealed larger individual variations after tumour cell inoculation in the flank than the foot pad. These results were associated with a slower and less regular drainage of **carbon particles** from the flank to the axillary and exceptionally the brachial **lymph node** than from the foot pad to the popliteal node after injection of India **ink**.

=> d his